

Notice of Allowability

Application No.

10/731,000

Examiner

Evan Pert

Applicant(s)

MONOE ET AL.

Art Unit

2826

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the fax dated May 4, 2005 and preliminary amendment dated 6-14-04.
2. ☒ The allowed claim(s) is/are 1-16.
3. ☒ The drawings filed on 05 August 2004 and 14 June 2004 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 1203, 0904, & 1104
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Allowable Subject Matter

2. Claims 1-16 are allowed.
3. The following is an examiner's statement of reasons for allowance:

The prior art discloses gate-overlapped drain (GOLDD) TFTs using laminated first and second conductive layers of different widths for both forming a gate and also for masking to form an LDD by implantation, yet the prior art fails to disclose applicant's inventive methodology as claimed:

Regarding claims 1-6, the claimed methodology, in the context of the comprehensively claimed invention, can be distinguished from prior art by steps that include "using a condition that has a fast etching rate of a mask pattern and etching a second conductive layer and a first conductive layer to form a tapered first conductive layer pattern," "selectively etching the second conductive layer in the first conductive layer pattern in accordance with the mask pattern left over the first conductive layer pattern to form a second conductive layer pattern," and "forming a lightly doped drain region with the second conductive layer in the second conductive layer pattern as a mask."

Regarding claims 7-8, the claimed methodology, in the context of the comprehensively claimed invention, can be distinguished from prior art by steps that include "etching a first and second conductive layer while recessing a mask pattern with the use of plasma to which sulfur hexafluoride is added to form a tapered first conductive pattern" and "forming a lightly doped drain region with the second conductive layer in the second conductive layer pattern as a mask."

Regarding claims 9-10 and 14-16, the claimed methodology, in the context of the comprehensively claimed invention, can be distinguished from prior art by steps that include an otherwise optional "third conductive layer" in a step of "laminating sequentially," with additional limitations similar to claims 1-6.

Regarding claims 11-13, the claimed methodology, in the context of the comprehensively claimed invention, can be distinguished from prior art by steps that include "using a condition that has a high selective ratio of a mask pattern to a second conductive layer and etching the second conductive layer and a first conductive layer to form a tapered first conductive layer pattern," "selectively etching the second conductive layer in the first conductive layer pattern in accordance with the mask pattern left over the first conductive layer pattern to form a second conductive layer pattern," and "forming a lightly doped drain region with the second conductive layer in the second conductive layer pattern as a mask."

Applicant's invention is enabled, for example, by disclosure of titanium as a first conductive layer, tantalum nitride as a second conductive layer, with a plasma to which sulfur hexafluoride (SF₆) is added for forming the claimed tapered first conductive layer pattern.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The patents and published applications disclose various inventions related to semiconductor devices having gate-overlapped LDD (e.g. GOLDD), yet none disclose the instant invention as claimed, particularly characterized by the limitations directed to the etching that forms a tapered first conductive layer pattern.

The two NPL documents cited disclose forming a GOLDD structure by a laminate of two conductive layers wherein the upper conductive layer is laterally etched to form a mask for the LDD that overlaps drain, yet there is no discussion or suggestion of applicant's claimed etching drawn to form a "tapered pattern."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Evan Pert whose telephone number is 571-272-1969.

The examiner can normally be reached on M-F (7:30AM-3:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ETP
August 29, 2005


EVAN PERT
PRIMARY EXAMINER